



**Barcelona
Supercomputing
Center**
Centro Nacional de Supercomputación



EXCELENCIA
SEVERO
OCHOA

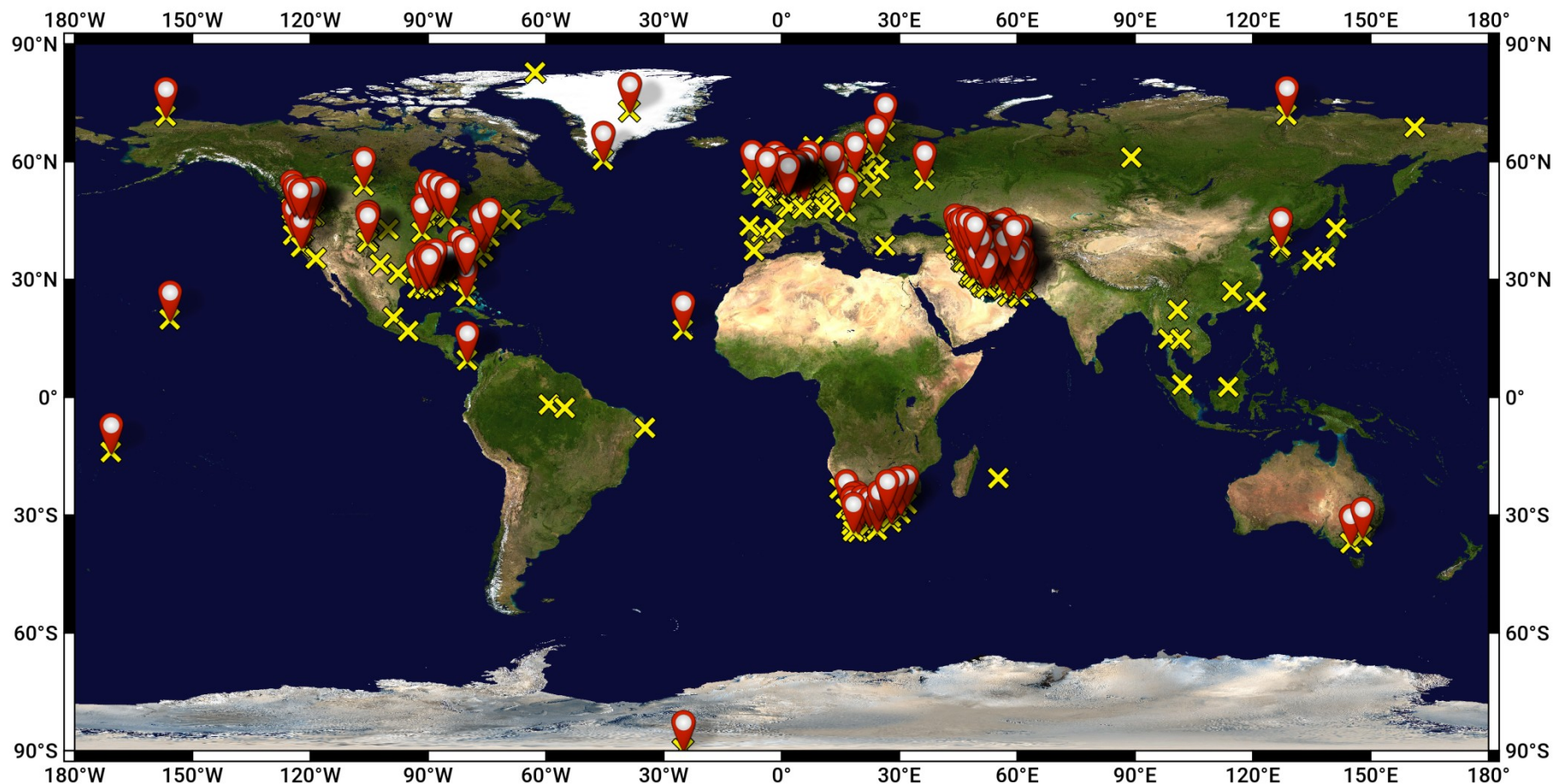
Tall wind mast data collection

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Llorenç Lledó

13/11/2018

INDECIS 2nd GA, Dublin

Tall tower database



Identified (311)



Processed (215)

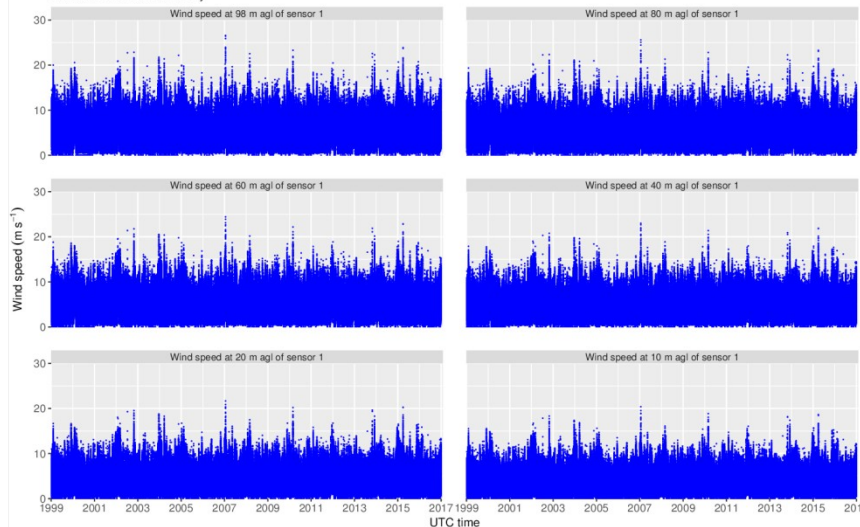
Tall tower summary sheets

Met tower name	Lindenberg
Country	DE
Institution	DWD
POR start	199901
POR end	201701
Measurement heights (m)	10, 20, 40, 60, 80, 98
Contact	udo.rummel@dwd.de; stefan.kern@uni-hamburg.de
Link	http://icdc.cen.uni-hamburg.de/1/daten/atmosphere/weathermast-lindenberg.html

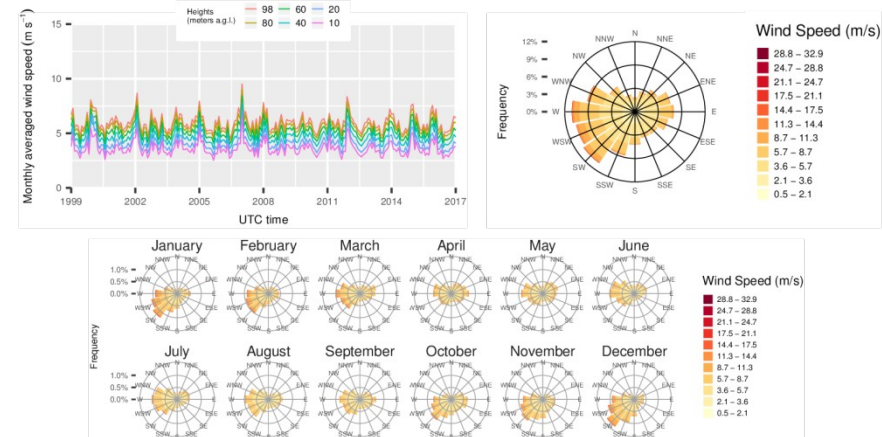


• Wind speed data at several heights above ground level:

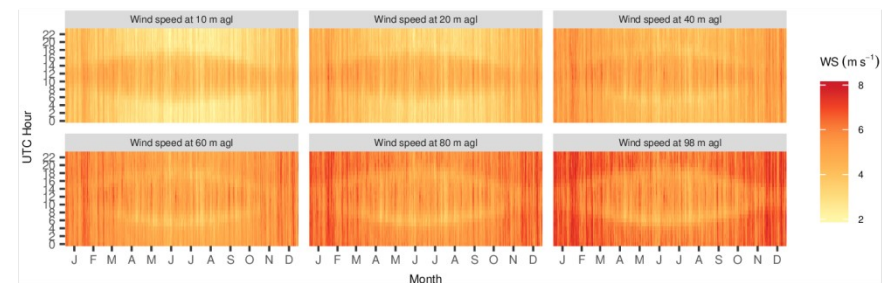
Resolution of data is 10minutely



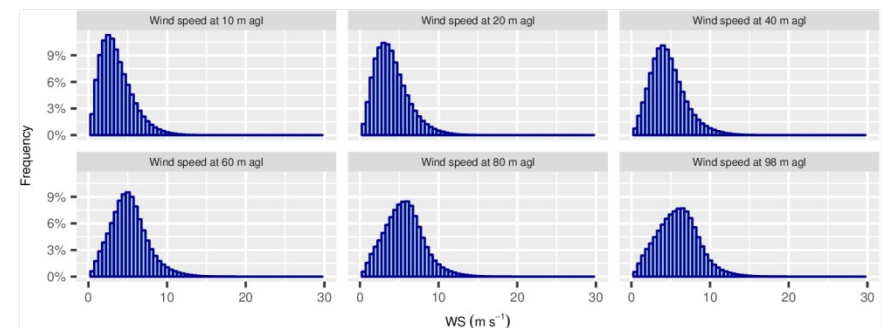
• Monthly means of wind speeds at several levels and wind roses of site mean wind speeds:



• Heatmaps of daily climatological and hourly averaged wind speed values:



• Histogram plot of wind speeds grouped in sectors of 0.5 ms^{-1} :



Potential users – future usage

RESEARCH

- Climate indices calculation. Capacity Factor (CF):

$$CF = \frac{\text{power produced}}{\text{max power prod.}}$$

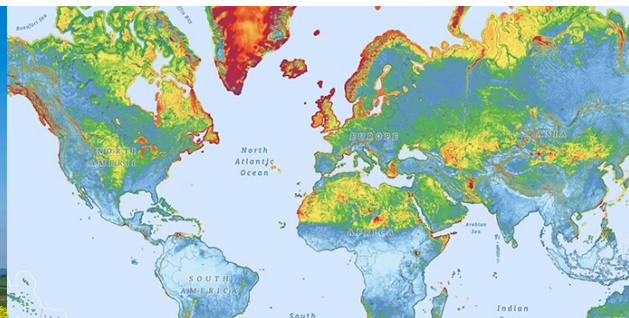
- PBL studies

VERIFICATION

- From mesoscale simulations to seasonal predictions
- Reanalysis datasets
- Wind atlas
- Satellite products

ENERGY

- Wind resource assessment
- Risk assessment for energy projects
- Measure-Correlate-Predict (MCP) methods



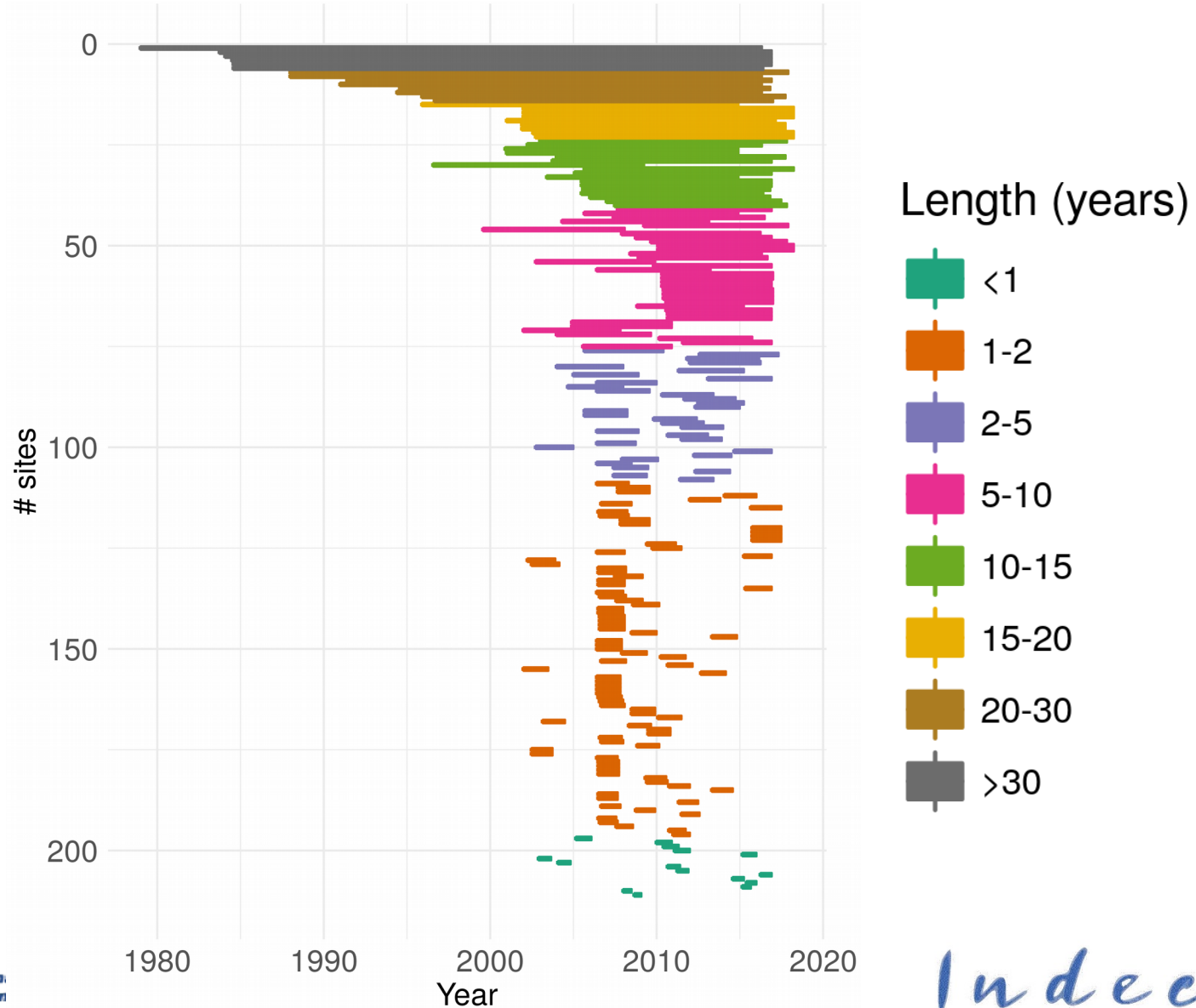
Main challenges

ISSUE		SOLUTION
IDENTIFICATION		<ul style="list-style-type: none">• Finished or ongoing projects, initiatives (NEWA, ICOS)• Existing databases (WDCGG, Marine Data Exchange)• Contacts
DATA ACCESS	<ul style="list-style-type: none">• Via data portal, ftp, email, etc.	<ul style="list-style-type: none">• Downloading scripts
FORMAT	<p>Lack of coordination:</p> <ul style="list-style-type: none">• Metadata• Time stamps format and sampling• Sensor redundancy• Units	<ul style="list-style-type: none">• Create scripts to process and standardise data format for each tall tower
STORAGE	<ul style="list-style-type: none">• Total size of original files: 146 GB	<ul style="list-style-type: none">• Total size of processed data using compressed NetCDF: 9.9 GB

Main challenges

ISSUE		SOLUTION
ORGANISATION OF THE INFORMATION	<ul style="list-style-type: none"> • Several measurement heights • Different time stamp samplings for the same tower • Sensor redundancy 	<code>\$tower_name\$/ \$time_resolution\$/ windagl\$height\$\$\$sensor_id \$/ windagl\$height\$\$\$sensor_id \$_YYYYMM.nc</code>
DATA POLICY	<ul style="list-style-type: none"> • Restrictions when transferring data to thirds 	<ul style="list-style-type: none"> • Publish list of tall towers and their metadata
QUALITY OF DATA	<ul style="list-style-type: none"> • Measurement errors • Inhomogeneities 	<ul style="list-style-type: none"> • QC for tall tower wind data

Periods of Record



Conclusions

- Data from more than 200 tall towers have been processed
- Data are in a standardised format. They will be easily transferable to the INDECIS portal
- The data policy issue will affect us in some cases.
- We aim to add more data to the Tall Tower Database.
- We will be able to release the Tall Tower Raw Database within the INDECIS Raw Database by December 2018.



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THANK YOU!

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Indecis
Sectorial Climate Services



European Research Area
for Climate Services



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